Nama : Bima Aditya Al-bahri
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UAS kecerdasan Buatan

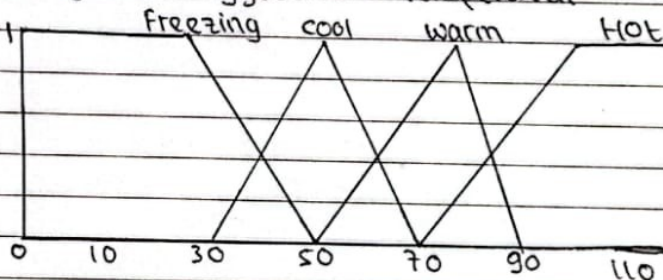Menghitung kecepatan mobil
berdasarkan suhu dan Cuaca

※ Fuzzification

Terdapat 2 variabel yaitu temperatur dan cloud
- Temperatur punya 4 linguistik yaitu Freezing, cool, warm, Hot.
- Cloud, mempunyai 3 nilai linguistik yaitu sunny, quitly cloudy, overcast

Fungsi keanggotaan : Temperatur

Temp (F°)

① Temp ($\leq = 30$)

Freezing $= 1$
cool $= 0$
warm $= 0$
Hot $= 0$

② Temp (> 30 dan < 50)

Freezing $= \dfrac{50 - temp}{50 - 30}$
cool $= \dfrac{temp - 30}{50 - 30}$
warm $= 0$
Hot $= 0$

③ Temp ($= 50$)

Freezing $= 0$
cool $= 1$
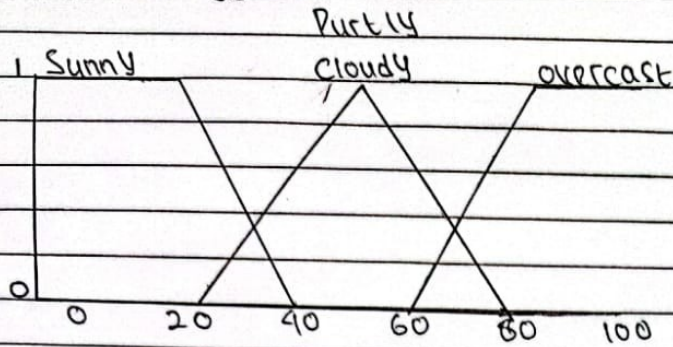warm $= 0$
Hot $= 0$

④ Temp (> 50 dan < 70)

Freezing $= 0$
cool $= \dfrac{70 - temp}{70 - 50}$
warm $= \dfrac{temp - 50}{70 - 50}$
Hot $= 0$

⑤ temp ($= 70$)

Freezing $= 0$
cool $= 0$
warm $= 1$
Hot $= 0$

Fungsi keanggotaan = Cloud Cover

Cloud Cover (%)

① cloud (≤ 20)

Sunny $= 1$

Partly Cloudy $= 0$

overcast $= 0$

② cloud (>20 dan <40)

Sunny $= \dfrac{90 - cloud}{40 - 20}$

overcast $= 0$

③ cloud (>20 dan <50)

Partly cloudy $= \dfrac{cloud - 20}{50 - 20}$

④ cloud (>50 dan <80)

Sunny $= 0$

Partly cloudy $= \dfrac{80 - cloud}{80 - 50}$

⑤ cloud (50)

Sunny $= 0$

Partly cloudy $= 1$

overcast $= 0$

⑥ cloud (>60 dan <80)

Sunny $= 0$

overcast $= \dfrac{cloud - 60}{80 - 60}$

⑦ cloud (≥ 80)

Sunny $= 0$

Partly cloudy $= 0$

overcast $= 1$

✳ Sistem Inferensi

membuat aturan, Jumlah aturan = $\sum$ var temperatur $\times$ $\sum$ var cloud cover

$$= 4 \times 3 = \underline{12}$$

Rules
1.) IF Freezing and sunny then slow
2.) IF Freezing and partly cloudly then slow
3.) IF Freezing and overcast then slow
4.) IF cool and sunny then slow
5.) IF cool and partly cloudly then slow
6.) IF cool and overcast then slow
7.) IF warm and sunny then Fast
8.) IF warm and partly cloudy then Fast
9.) IF warm and overcast then Fast
10.) IF Hot and sunny then Fast
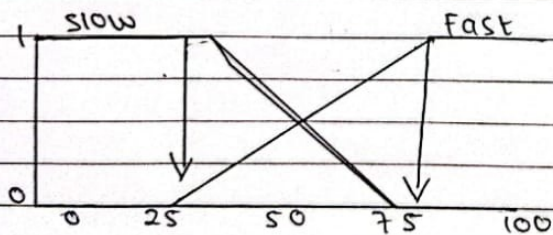11.) IF Hot and Partly cloudy then Fast
12.) IF Hot and overcast then Fast.

Fungsi menghitung memakai konyungsi, contoh :
IF its sunny and warm, drive Fast
Sunny (cover) $\wedge$ warm (temp) $\Rightarrow$ Fast (speed)
Fast = (min (sunny(cover), warm (temp))

✳ Deffuzifikasi

speed (MPH)
speed is 20% slow
and 70% Fast
speed = weighted mean
$$= \frac{(slow * 25 + fast + 75)}{(slow + Fast)}$$
$$= 2 \text{ mph}$$

Contoh Perhitungan Manual
Berapa kecepatan jika
− 65 F°
− 55 %

Jawab
− 65°F ⇒ cool = 0,25   warm = 0,75
− 55 % ⇒ partly cloudy = 0,83

IF cool and Partly cloudy then slow [Rule ke 5]
0,25 ∧ 0,8 = 0,25 ⇒ slow

IF warm and partly cloudy then fast [Rule ke 8]
0,75 ∧ 0,83 = 0,75 ⇒ fast

$$speed = \frac{(slow \times 25) + (Fast \times 75)}{slow + Fast}$$

$$= \frac{(0,25 \times 23) + (0,75 \times 75)}{0,75 + 0,25}$$

$$= \frac{6,25 + 56,25}{1}$$

$$= 62,5$$